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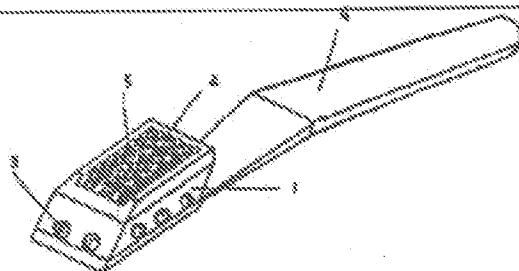
ELASTIC SURROUNDING WALL TOOTH PROTECTION TOOTHBRUSH

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[There are no amendments to this patent.]

Abstract

The present design pertains to a type of toothbrush that can clean and protect the teeth. The toothbrush contains an added elastic wall surrounding all of the bristles of the conventional toothbrush, which keeps the end surfaces of the bristles and the end surface of the surrounding wall in the same plane. The limit of elasticity of the entire elastic surrounding wall controls the length of the bristles, which project beyond the surrounding wall into free space in the vertical direction. At the same time, the two lateral edges of the surrounding wall prevent the bristles from expanding freely horizontally. In this way, the ability of the bristles of the toothbrush to clean the teeth with a safe bristle length and in regular state is guaranteed so that a real tooth protection effect can be realized.



Claims

1. A toothbrush comprising a brush head with bristles and a brush handle, characterized by the fact that it contains an elastic surrounding wall on the brush head that encloses all of the bristles; wherein the end surfaces of the bristles and the end surface of the surrounding wall are in the same plane, and wherein the limit of elasticity can control the bristles to a safe length, and the surrounding wall can prevent the bristles from expanding irregularly.

2. The toothbrush described in Claim 1 characterized by the fact that there is a chamfer angle of 45° between the upper end surface and the side surface of the outer wall of the elastic surrounding wall, wherein the upper end surface of the front wall is completely chamfered.

3. The toothbrush described in Claim 1 characterized by the fact it contains a row of water discharge holes below each of the four corners of the elastic surrounding wall.

Specification

The present design pertains to a toothbrush for cleaning the teeth. In particular, the present invention pertains to a type of toothbrush that can protect the teeth with the aid of an elastic surrounding wall.

The basic structure of a conventional toothbrush has three or four rows of bristles at one end of the brush handle. Dentists and dental practitioners always remind people to pay attention to the brushing method they use with this type of toothbrush. When brushing, the user of the toothbrush is required to place the bristles perpendicular to the teeth. At the same time, the user is required to keep the toothbrush horizontal with respect to the teeth. The arm is then moved to make the bristles go up and down against the surface of the teeth in order to effect cleaning of the teeth.

However, when using the conventional toothbrush to brush the teeth by following the method recommended by dentists, people are usually unable to clean their teeth because they are unable to apply force to the toothbrush. Also, this method takes a very long time, which does not fit the fast pace of modern life. Therefore, most people still brush their teeth by moving the

toothbrush back and forth in the horizontal direction. As a result, the bristles continually damage healthy teeth.

The reason for the damage caused by the conventional toothbrush is that the bristles are unable effectively to control a force applied to them. The exposed part of the tooth includes the crown, tooth neck, and gums [sic]. The crown part is protected by hard enamel. The gums are made up of strong connective tissue, which is difficult to damage. Only the tooth neck, which is between the crown and gums, is at risk because it lacks the protection of the uniform enamel and is also not protected by the gums. When a force is applied, the bristles on a conventional toothbrush will damage the nonuniform enamel on the surface of the tooth neck in the vertical direction and then go deep to damage the bone structure of the teeth. The bristles will go deeper and damage the structure of the dental pulp. This is the cause of so-called wedge damage to the teeth. When a force is applied, the bristles of the conventional toothbrush will also expand irregularly in the horizontal direction to gradually strip away the gums from the teeth. As a result, the gum line will recede; the root will be exposed, and the tooth will become loose and eventually fall out. One may conclude that the conventional toothbrush does not protect the teeth in any way. On the contrary, it will damage healthy teeth. Information about wedge-like damage caused by toothbrushes can be found in any dental handbook or dental monograph.

The purpose of the present design is to change thoroughly the unreasonable structure of the conventional toothbrush by providing a type of toothbrush, which can not only clean teeth but also prevent bristles from damaging healthy teeth in either the vertical direction or the horizontal direction with the aid of an elastic surrounding wall so that teeth can be truly protected.

The purpose of the present design is realized by adding an elastic enclosure to the brush head of the conventional toothbrush based on scientific theories of theoretical mechanics and mechanics of materials. More specifically, an elastic surrounding wall is added to the bristle area of the toothbrush. The wall encloses all of the bristles in a regular way. The end surface of the surrounding wall and the end surfaces of the bristles are kept in the same plane.

The limit of elasticity of the elastic surrounding wall controls the length the bristles can project in the vertical direction beyond the surrounding wall in free space so that the teeth can be cleaned and protected with a safe bristle length that will not damage them. This is like the body of a safety razor, which allows the blade to cut the whiskers without damaging the skin.

The elastic surrounding wall also uses the side wall to prevent the bristles from expanding in the horizontal direction so that the bristles will not damage the connection between gums and teeth to prevent shrinkage of the gums and exposing the roots, which will cause the teeth to become loose and fall out. The dynamic end surface of the surrounding wall can also massage the gums.

Since the aforementioned scheme is adopted, during brushing of the teeth, the elastic surrounding wall tooth protection toothbrush can control the length the bristles can project vertically beyond the surrounding wall in free space and can also prevent the bristles from expanding horizontally to realize the tooth protection function. In addition, because of the control provided by the elastic surrounding wall, people can use the brushing method that suits them best, so that even the conventional tooth brushing method will not damage the teeth. On the contrary, since force can now be applied safely with the conventional method, it is possible to clean the teeth and save time. This fits the fast pace of modern life.

In the following, the present design will be explained in more detail with reference to the attached figures and application examples.

Figure 1 is a diagram illustrating the structure and parts of the present design.

Figure 2 is a diagram illustrating assembly of the elastic surrounding wall and the bristles.

Figure 3 is a diagram illustrating the working theory of the elastic surrounding wall.

In the figures, 1 represents the side of the surrounding wall; 2 represents the end surface of the surrounding wall; 3 represents a water discharge hole; 4 represents the brush handle, and 5 represents the bristles.

In Figure 1, the elastic surrounding wall has relatively wide walls on four sides and two relatively thin walls in the middle. There is a row of water discharge holes below each side of the surrounding wall. The bottom of the surrounding wall is closely adhered to the head of the toothbrush handle. The angle between the end surface and side surface is chamfered to 45° . There is no end surface left on the top of the front wall so that the back of the teeth can be brushed.

In Figure 2, the elastic surrounding wall is first installed at the end of the brush handle. Then, the bristles are implanted in the head of the brush handle using a conventional method. Also, the bristles are trimmed so that the end surfaces of the bristles are in the same plane as the end surface of the surrounding wall.

Figure 3 is a cross-sectional view of the brush head with the elastic surrounding wall. Figure 3-1 shows the elastic surrounding wall with no applied force. The end surfaces of the bristles are in the same plane as the end surface of the surrounding wall. In Figure 3-2, force is applied to the elastic surrounding wall during brushing of the teeth. As a result, the elastic surrounding wall is compressed, and the bristles project into free space. The length of the bristles is restricted by the limit of elasticity of the surrounding wall to ensure a safe bristle length. Since the bristles brush the teeth with a safe length and in a regular state, the teeth can be protected.

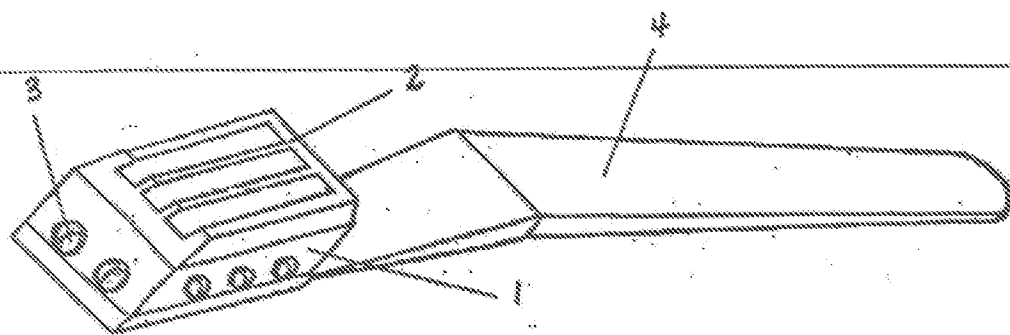


Figure 1

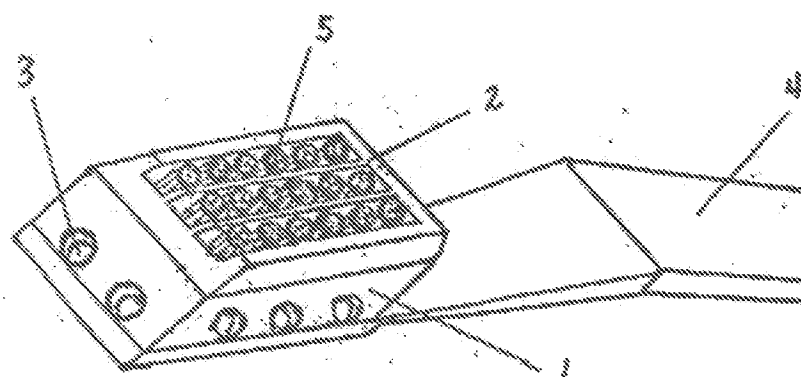


Figure 2

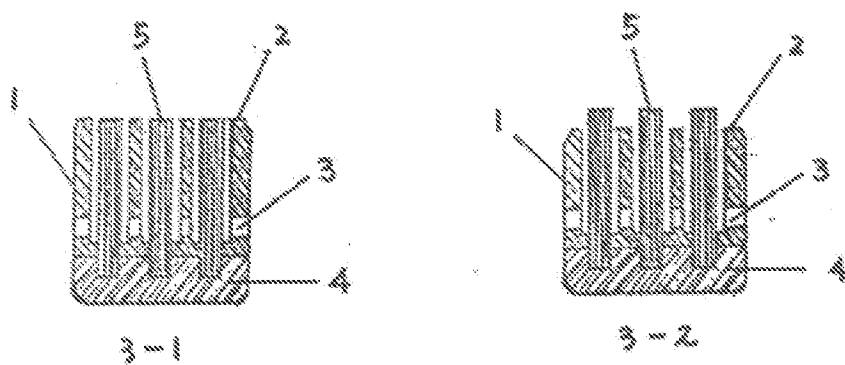


Figure 3

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[12] 实用新型专利说明书

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[54] 实用新型名称 弹性围壁护齿牙刷

[57] 摘要

一种能清洁牙齿又能保护牙齿的牙刷,它是在现行牙刷的刷毛部分,加一个弹性围壁装置,将刷毛全部包圍在围壁里面,并使刷毛端面与围壁端面处在同一个平面中。弹性围壁整体的弹性极限,在纵向上控制刷毛在自由空间伸出围壁的长度;同时围壁的两侧边缘在横向上控制刷毛自由外露。从而确保了牙刷刷毛在安全长度和规范状态下清洁牙齿,实现了真正意义上的护齿作用。



权利要求书

1、一种牙刷，由具有刷毛的刷头和刷柄构成，其特征是：在刷头部分有一个弹性围壁装置，将刷毛全部包围在里面，且刷毛端面 and 围壁的端面处在同一个平面中，其弹性极限能控制刷毛的安全长度，围壁能防止刷毛不规则外翻。

2、根据权利要求1所述的牙刷，其特征是：弹性围壁外围壁的上端面与侧面间倒45度角，正前围壁上部端面，在倒角时全部倒去。

3、根据权利要求1所述的牙刷，其特征是：弹性围壁四周的下部各有一排排水孔。

说明书

弹性围壁护齿牙刷

本实用新型是涉及一种清洁牙齿的牙刷，尤其是通过弹性围壁的作用，而起到保护牙齿不受损害的牙刷。

目前，现行的牙刷其结构基本上是：在刷柄的另一端装有三至四排刷毛。在使用这种牙刷时，牙医和牙科专家告诫人们要注意刷牙的方法。要求人们在刷牙时，将刷毛垂直地置于牙齿上，同时要求将牙刷与牙齿保持相同的水平方向，然后转动手臂，使刷毛在牙齿表面上下移动，达到清洁牙齿的目的。

但是，以现行牙刷并采用牙医要求的方法刷牙，由于一是用不上劲而达不到洁齿的目的；二是要化很长的时间，不适合现代人快节奏的生活习惯。于是，多数人仍采用拉锯式的方法刷牙，结果使刷毛不断地在破坏健康的牙齿。

现行牙刷所以会破坏牙齿，是由于刷毛在受力状态下，无法得到有效的控制。牙齿的外露部分由牙冠、牙颈和牙龈组成。牙冠部分有坚硬的珐琅质所保护；牙龈是由坚韧的结缔组织所构成不易受损害；唯有牙颈，它处于牙冠和牙龈之间，既缺少均匀的珐琅质保护，又无牙龈给予呵护，是一个危险区域。现行牙刷的刷毛，在受力状态下，在纵向上，它会破坏牙颈表面不均匀的珐琅质，然后深入地破坏牙齿的骨本质，再深入便破坏牙髓的结构，这就是所谓牙齿的楔形损害所造成原因；现行牙刷的刷毛，在受力状态下，同时在横向上会产生不规则的外翻，这样刷毛会渐渐地使牙龈与牙齿剥离开来。导致的后果是，牙龈萎缩，牙根暴露，牙齿松动，最后脱落。结论是：现行牙刷没有任何意义上的护齿作用，相反，它会破坏人们健康的牙齿。关于牙刷破坏牙齿而产生楔形缺损的材料，可以在任何一本牙医手册或牙科专著中找到答案。

本实用新型的目的，是彻底改变现行牙刷的不合理性，提供一种牙刷，它不仅能清洁牙齿，而且通过弹性围壁的作用，使刷毛在纵向上和横向上均不会破坏健康的牙齿，达到真正保护牙齿的目的。

本实用新型的目的，是以理论力学和材料力学的科学原理，通过在现行牙刷的刷头，增加一个弹性围壁装置来实现的。具体是，在牙刷的

刷毛端，增加一个弹性围壁，将牙刷的刷毛全部有规则地包围在围壁里，并使围壁的端面与刷毛的端面，处于同一个平面里。

弹性围壁以其弹性极限，在纵向上控制刷毛在自由空间位置时能伸出围壁的长度，并在不产生对牙齿破坏的安全长度下，达到清洁牙齿和保护牙齿。这就像剃胡子的刀架，它能让刀刃剃下胡子，但不会伤害皮肤一样。

弹性围壁装置还利用侧边的围壁，在横向上控制刷毛不规则外翻，使刷毛不会破坏牙龈与牙齿之间的粘连，防止了牙龈的萎缩和牙根暴露而使牙齿松动脱落；同时，围壁具有动感的端面有按摩牙龈的功效。

由于采用了上述方案，弹性围壁护齿牙刷，在刷牙时，对刷毛在纵向上控制其在自由空间伸出围壁的长度，在横向上控制其自由外翻，从而达到了护齿的目的。另外，由于有了弹性围壁的控制，人们可以采用适合自己的方式刷牙，即使是拉锯式刷牙，也不会损坏牙齿。相反，由于使得上重力，可以达到既能洁齿又节约时间的目的，适合现代人快节奏的生活方式。

下面，结合附图和实施例，对本实用新型作进一步说明。

图1是本实用新型构造和部位图

图2是弹性围壁装置与刷毛的装配图

图3是弹性围壁工作原理图

图中：1、围壁侧面 2、围壁端面 3、排水孔 4、刷柄 5、刷毛

在图1中，弹性围壁装置四周是较厚的围壁，中间有两条较薄的壁。在围壁四周的下部各有一排排水孔，围壁底部与牙刷柄头部紧密相连。其端面与侧面的夹角侧成45度角，正前方的壁端上部不留端面，以适应刷牙时的背面。

在图2中，弹性围壁先安装在刷柄端部，然后将刷毛按常规工艺植入牙刷柄头部，并将刷毛修齐，使其端面与围壁端面处在同一个平面中。

在图3中，是弹性围壁刷头的截面图。3-1是弹性围壁处在正常状态下，刷毛的端面与围壁端面处在同一个平面中。3-2是弹性围壁在刷牙时，受力状态下，弹性围壁收缩，刷毛伸出自由空间，其长度以弹性极限为限，确保安全长度。由于刷毛处在安全长度和规范状态下刷牙，所以起到了保护牙齿的作用。

说明书附图

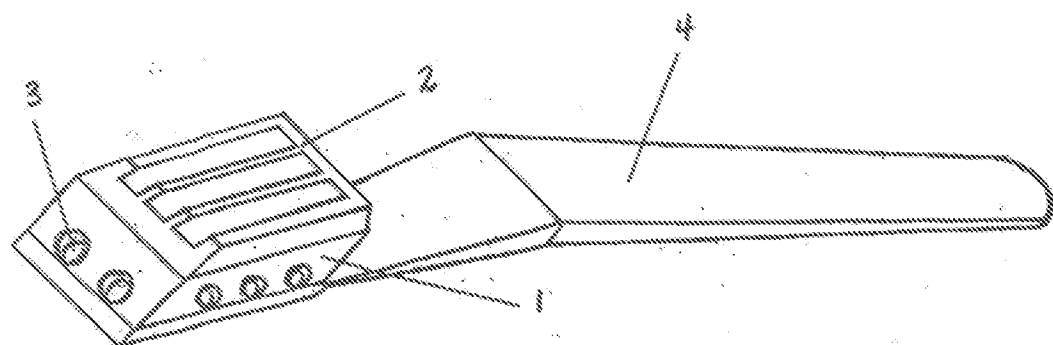


图 1

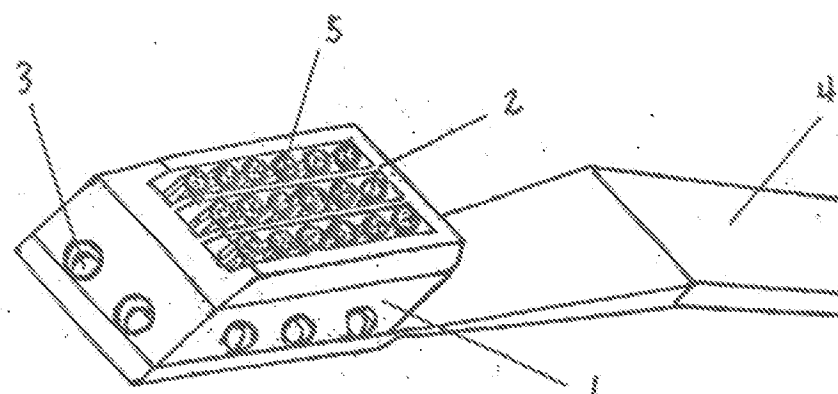
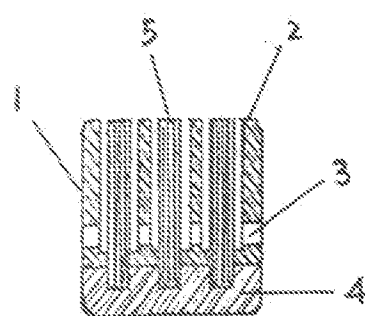
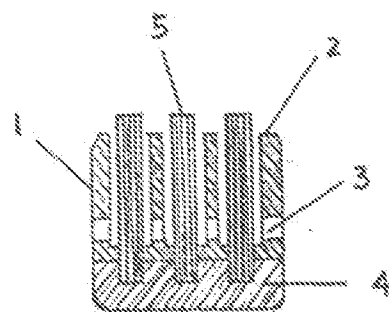


图 2



3-1



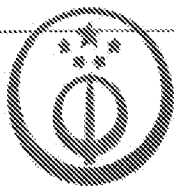
3-2

图 3

[19]中华人民共和国专利局

[51]Int.CI⁸

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[54]实用新型名称 多方位保健牙刷

[57]摘要

一种多方位保健牙刷，刷毛固定在一个刷毛座上，刷毛座的背部设有一个圆形插接卡口，刷柄的头部设有与该插接卡口相配合的圆形插接卡头，卡头插入卡口卡住后，刷毛座可以转动且不会与刷柄脱落。另外，在刷毛座的插接卡口外开有齿形轮，刷柄前部的内腔装有后部装有弹簧的固定杆，固定杆在弹簧的作用下顶住齿状轮，使刷毛座不能随意转动。本多方位保健牙刷由于刷毛座与刷柄的夹角可调，可使刷牙使用时角度更加灵活，洁齿效果更好。

